



Case report

Non-fatal gunshot wounds in the context of intimate partner violence. The importance of a multidisciplinary approach: A case report

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ABSTRACT

According to Portuguese law, if a case of intimate partner violence is noticed or suspected by a professional working in public services, reporting it to the police, medico-legal services or directly to the public prosecutor is mandatory. However, in most cases, reporting does not take place, despite its vital importance in triggering the multidisciplinary intervention that will ensure the correct and timely diagnosis and protection of the victim.

In the present case, the victim, a 37 year-old woman, was sexually and physically abused by her husband in their home, and was physically abused again at the victim's mother's house. The victim mentioned that her husband struck her in the head with a hammer and shot a handgun while in her mother's house. However, she denied having a gunshot wound. The couple's daughter was also slapped in the face by her father. The police took the victim to the emergency room of a central hospital to receive medical attention, while the medical examiner on duty was called to the same emergency room to perform a medico-legal evaluation in the context of the intimate partner violence reported to the police.

Medico-legal assessment revealed scalp injuries that had not been detected during the first inspection by the emergency room attending physicians who had performed a neurological examination, which revealed no neurological dysfunction. A cranial computed tomography with three-dimensional reconstitution and virtual dissection, requested by the medical examiner, revealed two projectiles trapped in between the inner and the outer table of the cranium, with linear fractures only in the inner table and no brain injuries. Gynecological examination with the collection of biological evidence, also performed by the medical examiner, made it possible to identify a male DNA profile matching her husband's.

The victim was subjected to neurosurgery and a follow-up, and was released one month after the traumatic event.

A forensic psychological evaluation, performed one month after the traumatic event, revealed the presence of reactive symptoms to the occurrence.

This multidisciplinary intervention and the use of modern diagnosis imaging techniques allowed for a timely diagnosis and treatment, adequate protection of the victim and her family, as well as the identification of the aggressor, who was arrested.

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1. Introduction

Intimate partner violence (IPV) is an epidemic that plagues our society. Despite its overwhelming incidence and prevalence, this specific type of abuse goes unrecognized and unaddressed in the vast majority of health care settings.¹

After an episode of violence, most of the victims usually seek out medical attention in health care centers or hospital emergency rooms (ER)^{2,3} before coming to medico-legal services. Therefore, physicians working in those settings are usually the first individuals to establish contact with these victims and have the opportunity to detect, screen and report IPV.

According to Portuguese criminal law (article 242 of the Criminal Procedure Code), all professionals working in public services that notice or suspect IPV must report it to the public prosecutor (directly in a police department or through the national medico-legal services).

Reporting a suspicious IPV situation is a fundamental step in the process that will initiate multidisciplinary intervention in these cases, which will ensure the correct and timely diagnosis, treatment and protection of the victim. However, in most situations, Portuguese healthcare professionals do not report them, which is a common occurrence in other countries as well. As cited in the specialized literature, the report of such a specific kind of violence becomes difficult to accomplish for a number of reasons: barriers related to the lack of provider education, fear of offending patients, limited time for interviews or even the lack of effective means of intervention.¹

The main point of this case report is to focus on the importance of the multidisciplinary intervention of clinical, medico-legal and judicial services, working concurrently to deal with IPV situations. Appropriate identification and multidisciplinary intervention in this kind of violence will surely contribute to the prevention of cycles of violence,¹ to which these families are subjected.

2. Case report

In January 2008, medico-legal assessment was performed on a 37 year-old woman, at a central hospital's ER. The victim was brought to the ER by police officers after she was sexually assaulted and physically abused by her husband.

In the first clinical evaluation at the hospital's ER, she was described by the attending physician as being conscious, oriented and cooperative; the victim described that she had been beaten on the head with a wooden helve hammer. Upon physical examination, three scalp injuries were observed, and described only as "abrasion, hematoma and deformity". No other kinds of injuries were mentioned. Since neurological examination revealed no alterations, the attending physician, following a regular clinical course of action, decided it was not necessary immediately to perform a radiological examination.

Following the legal proceedings established by the Portuguese law that regulates intimate partner violence situations, the medical examiner (M.E.) on duty was called by police officers to the same ER.

A thorough medico-legal interview of the victim revealed that the violent episode began with death threats and sexual assault in the couple's home. The sexual assault included, vaginal and anal intercourse, with the husband introducing ice cubes into the victim's vagina and anus during and after intercourse. After this, the victim and her husband left their home to pick up their 17 year-old daughter at the victim's mother's house. Once there, the victim convinced her husband to let her and their daughter spend the night at the victim's mother's house. However, a few hours later, the perpetrator burst into his mother-in-law's house, breaking the door with a wooden helve hammer. The victim affirmed that she hid under the bed because she heard gunshots from a handgun that

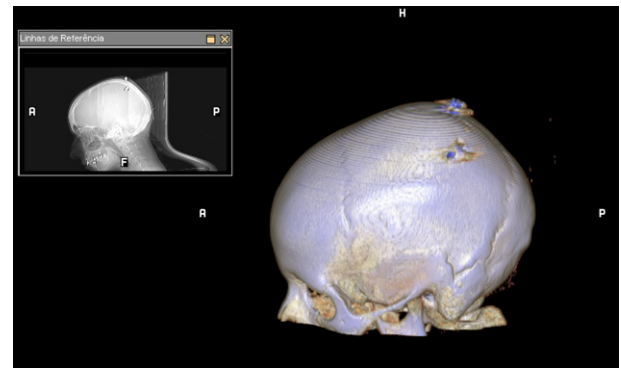


Fig. 1. 3D-Volume rendered image of the skull with metallic density filter applied (coded in blue) showing the anatomical location of both projectiles. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

her husband was carrying. She also said she was struck by the hammer as her husband pulled her from under the bed. The couple's daughter had also been struck by the hammer before, while she was trying to keep the father from entering the room.

A meticulous physical examination performed by the M.E. revealed that the injuries previously described by the attending physician as "abrasion, hematoma and deformity", turned out to be two entrance wounds in the scalp caused by projectiles. Meanwhile, police investigators at the crime scene informed the M.E. that the wooden helve hammer was found broken but had no macroscopically apparent blood stains.

A cranium X-ray (face and profile images) requested by the M.E. detected two radio-opaque small-sized objects in both parietal regions. As there were doubts about the degree of penetration of both objects in the cranium, a Three-Dimensional Multi-Slice Computer Tomography (3D-MSCT) was performed. A Philips Brilliance 16-Slice CT scanner was used. No oral or intravenous contrast was administered. Unique acquisitions in the standard algorithm with 3 mm axial cuts allowed for posterior two- and three-dimensional reconstitutions using different reconstruction algorithms from RAW-Data (Figs. 1–5). Both objects were characterized as metallically-dense objects by analysis with the R.O.I. Tool. This exam fulfilled both clinical and forensic purposes, because it was necessary to determine the exact position of both of the bullets, the bullet trajectories and the extension of damage. The 3D-MSCT showed that the bullets had caused skull fractures on the inner table of the skull, but without the significant deviation of bone fragments and brain injury.

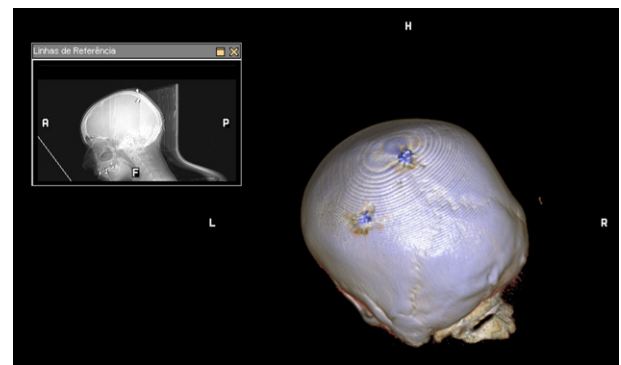


Fig. 2. 3D-Volume rendered image of the skull with metallic density filter applied (coded in blue) showing the anatomical location of both projectiles. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

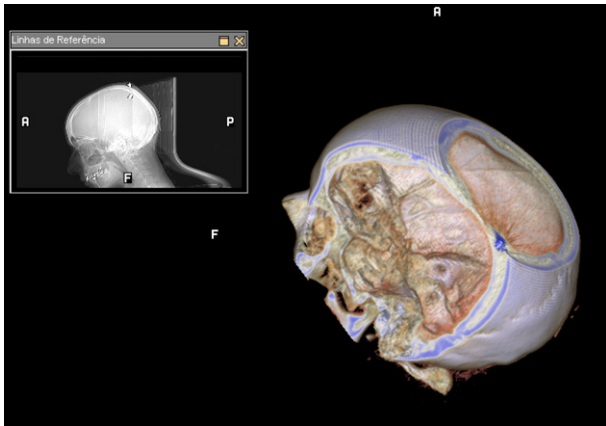


Fig. 3. 3D-Volume rendered image with virtual dissection showing the one of the two projectiles that was stuck in between the inner and the outer table.

Due to the sexual assault, medico-legal assessment was also performed following Portuguese guidelines, which were modeled after the guidelines of the World Health Organization.⁴ These guidelines include a gynecological examination with the collection of biological evidence to detect semen and, consequently, to determine the perpetrator's DNA profile. In this case, despite the previous use of ice intravaginally and intra-anally during the sexual abuse situation, the sample revealed the presence of prostatic acid phosphatase activity and spermatozooids, making it possible to identify a male DNA profile matching the victim's husband.

Subsequently, the victim was subjected to neurosurgery during which the two bullets were extracted and a left parietal cranioplasty was performed. The victim's condition was monitored by neurosurgeons, and she was released one month after the traumatic event with no neurological damage.

A forensic psychological evaluation, performed one month after the traumatic event, revealed the presence of reactive symptoms to the occurrence: severe anguish, emotional instability and serious damage in social, professional and familiar fields.

The suspect was arrested and remains in custody.

3. Discussion

Physicians working in hospitals and health care centers must be aware of the procedures that need to be taken regarding IPV victims and also must be able to ensure the collection and preservation of all types of evidence. This can be achieved by accomplishing

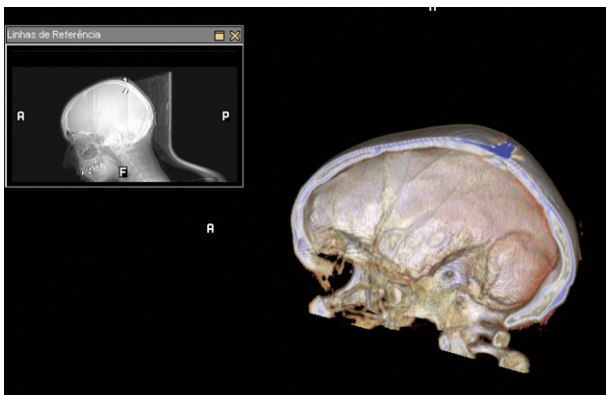


Fig. 4. 3D-Volume rendered image with virtual dissection showing the one of the two projectiles that stroke only the outer table.

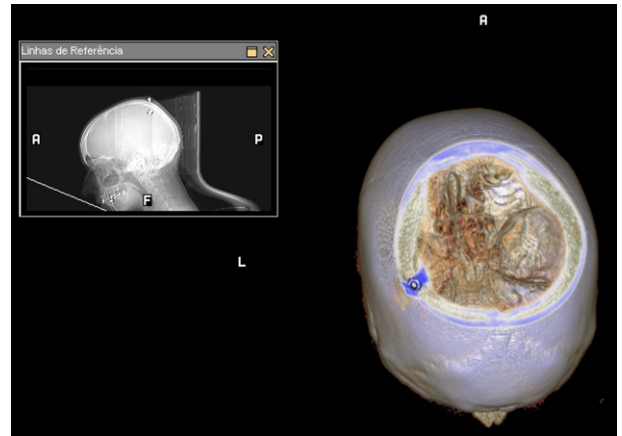


Fig. 5. 3D-Volume rendered image with virtual dissection showing the one of the two projectiles that was stuck in between the inner and the outer table.

interdisciplinary intervention through reporting cases to competent authorities. In fact, in IPV cases, the medical examiner's intervention is of the utmost importance allowing the M.E. to gather essential information and evidence that, if not collected at that moment, will be lost forever. Working towards that goal, the Portuguese medico-legal organization provides on-call urgent forensic assessments with medical examiners working everyday on a 24-h rotation basis. These urgent medico-legal assessments are performed in situations where collection and preservation of biological samples are mandatory and the biological material is very likely to be lost or rapidly degraded with time (article 13 of the Portuguese Law 45/2004, August 19th). These mandatory actions are included for crime scene investigations in cases of suspected homicides. Physical examinations and sample collection are mandatory in cases of suspected abuse victims (especially sexual abuse cases).

However, this medico-legal intervention is often impaired due to the lack of timely and correct reports, as seen in Portuguese criminal law. This problem is usually related to the attending physicians' general lack of knowledge of the correct course of action regarding the mandatory reporting of a complaint. This problem is mostly associated with the Portuguese physicians' belief that they are compromising the patient's medical confidentiality by reporting an IPV case. The case goes unreported due to the physicians' poor understanding of the importance and significance of reporting these cases.

Subsequently, the correct and timely diagnosis of such cases, the collection and preservation of physical evidence or biological samples maintaining the chain of custody, and the risk evaluation regarding the victim's situation with the goal of adequately and urgently protecting them are all impaired.

Several recent studies^{5,6} suggest that some indicators can provide a measure of the risk of homicide within an IPV case. Factors associated with the suspect include previous physical assault by the suspect; previous sexual assault by the suspect; escalation and severity of violence, including use of weapons and attempts of strangulation; child abuse by the suspect; the suspect's possessiveness; jealousy or 'stalking' behavior; threats/attempts to commit suicide by the suspect; threats/fantasies of committing a homicide by the suspect; previous criminality and/or the breach of civil/criminal court order/bail conditions by the suspect; the suspect's psychological and emotional abuse of the victim, including the denial/minimization of violence; and the suspect's misuse of illegal/prescription drugs and/or alcohol or mental health problems. Conversely, factors associated with the victim, such as indicators of homicide risk, include victim's perception of the risk of future harm, current or imminent

separation from the suspect, pregnancy of the victim, disability and/or mentally/physically ill health and social isolation and particular vulnerability.^{5,6}

However, different studies revealed dissimilar risk values. The confounding plethora of assessment tools is, in itself, indicative that many questions and much doubts remain regarding the assessment of homicide risk. Meanwhile, the high proportion of severe IPV and homicide episodes in households that had never previously come to the authorities' attention serve to remind us that, in any case, these tools are likely to remain of relatively limited value in preventing domestic homicide.⁷

In the present case, besides the correct and appropriate multi-disciplinary intervention, the use of modern diagnosis imaging techniques made a diagnosis easy, and it greatly aided the criminal investigation.

In the medico-legal assessment of violence involving firearms, imaging techniques have a particularly important role, especially in determining a bullet's path through the victim's body. The analysis of these trajectories can be performed by the use of three-dimensional reconstitution techniques, such as Multi-Slice Computed Tomography (3D-MSCT).⁸ This technique provides information that can be used to improve the criminal investigation and to assist the future prosecution⁹ in IPV situations.

In Portugal, radiologists are more accustomed to intervention and to their role as clinical experts; they are not forensic experts usually, and they are unfamiliar with criminal investigation procedures in relation to obtaining expert evidence. Thus, it is of the utmost importance to provide attending radiologists with the information from the external physical examination because entrance wounds can be hidden by matted hair (this happened in the present case) or by clothes. Radiologists must also know that the final radiological report is always to be sent to the medical examiner, thus contributing significantly to the outcome of the medico-legal evaluation of these cases. The radiologist should be aware of the possibility of being presented in court as an expert and questioned about the imaging techniques, procedures and results.¹⁰

In the present case, 3D-MSCT examination enabled the projectiles to be detected and accurately located. This fact made it possible to select the proper course of treatment for the victim and to provide strong evidence, leading to the offender's arrest.

4. Conclusions

In cases of IPV, a multidisciplinary, simultaneous intervention that includes clinical support, medico-legal interaction and police involvement is of the utmost importance, as demonstrated in the present case. The main goal is to obtain as much evidence as possible during the first contact with the victim, which will avoid multiple subsequent interviews and physical examinations, secondary victimization, evidence destruction and delay of the judiciary decision. In fact, multidisciplinary intervention and the

use of modern diagnosis imaging techniques allowed for the timely diagnosis and treatment of the victim, the adequate protection of the victim and her family, and the identification of the aggressor.

Clinical physicians are usually the first professionals to come into contact with victims of IPV. They should always be aware of such situations to be able to suspect, detect, screen and report this specific kind of violence, which presents high recurrence and fatality rates. They also must know that they cannot rely only on the spoken information supplied by the victim because he/she has a tendency to conceal or even distort the facts. Above all, clinicians should never forget that a complete and thorough physical examination may offer more extensive and accurate information than the victim could provide. Thus, we consider that physicians from all clinical specialties would greatly benefit from better, general medico-legal training. The deficiency of training in this area and the lack of interest from academic authorities to remedy that deficiency, is slowly but steadily changing, making newly-graduated physicians more open-minded and aware of these situations.

Ethical approval

This study has been carried out in accordance with ethical rules and it has not been submitted to Ethical Approval because it is a case report in which no invasive studies were carried out nor identification of the individual was given.

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Conflict of interest statement

We state that neither the author nor any of the co-authors have any potential conflict of interests related to the publication of this paper.

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